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CLAIMS

WHAT IS CLAIMED:

1 1. A method, comprising:
2 sighting a position correlated to at least a subset of a three-dimensional data set
3 representing a field of view; and
4 targeting a controlled system to the position from the three-dimensional data set.

1 2. The method of claim 1, wherein the three-dimensional data comprises
2 LADAR data.

1 3. The method of claim 1, further comprising at least one of:
2 acquiring the three-dimensional data;
3 processing the three-dimensional data;
4 displaying a representation of the three-dimensional data;
5 displaying a projected target point after the controlled system is targeted; and
6 taking an action responsive to targeting the position.

1 4. The method of claim 3, wherein acquiring the three-dimensional data includes:
2 transmitting a plurality of LADAR pulses; and
3 receiving the LADAR pulses after they are reflected.

1 5. The method of claim 3, wherein processing the three-dimensional data
2 includes generating a three-dimensional image from the three-dimensional data.

1 6. The method of claim 5, wherein the three-dimensional image is the
2 representation.

1 7. The method of claim 5, wherein generating the three-dimensional image
2 includes:
3 pre-processing the three-dimensional data;
4 detecting a target represented by a subset of the three-dimensional data;
5 segmenting the subset from the remainder of the three-dimensional data;
6 extracting features of the target from the segmented data; and
7 classifying the segmented subset as including a particular kind of target based on the
8 extracted features.

1 8. The method of claim 1, wherein sighting the position indicating a portion of a
2 displayed image generated from the three-dimensional data.

1 9. The method of claim 8, wherein targeting the controlled system includes
2 aiming a weapon system at the sighted position.

1 10. The method of claim 1, wherein targeting the controlled system includes
2 aiming a weapon system at the sighted position.

1 11. An apparatus, comprising:
2 a program storage medium capable of storing a three-dimensional data set
3 representing a field of view;
4 a controller capable of generating a presentation of the three-dimensional data set;
5 a controller interface through which a position represented by at least a subset of the
6 three-dimensional data can be sighted and through which the position can be
7 targeted from the subset.

1 12. The apparatus of claim 11, wherein the program storage medium comprises a
2 magnetic program storage medium or an optical program storage medium.

1 13. The apparatus of claim 11, wherein the magnetic program storage medium
2 comprises a floppy disk, a zip disk, or a hard disk.

1 14. The apparatus of claim 12, wherein the optical program storage medium
2 comprises an optical disk.

1 15. The apparatus of claim 11, wherein the controller comprises a digital
2 processor.

1 16. The apparatus of claim 15, wherein the digital processor is a microprocessor
2 or a digital signal processor.

1 17. The apparatus of claim 11, wherein the controller interface includes a display.

1 18. The apparatus of claim 17, wherein the display is a helmet-mounted display or
2 a rack-mounted display.



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- 1 19. The apparatus of claim 11, wherein the display includes a touch screen.
- 1 20. The apparatus of claim 17, wherein the controller interface includes at least
2 one peripheral input/output device.
- 1 21. A controlled system, comprising:
2 a data acquisition system capable of acquiring a three-dimensional data set
3 representing a field of view;
4 a sighting and targeting subsystem, including:
5 a program storage medium capable of storing the three-dimensional data set;
6 a controller capable of generating a presentation of the three-dimensional data
7 set; and
8 a controller interface through which a position represented by at least a subset
9 of the three-dimensional data can be sighted and through which the
10 position can be targeted from a presentation of the subset;
11 a control subsystem capable of implementing instructions from the sighting and
12 targeting subsystem.
- 1 22. The controlled system of claim 21, wherein the data acquisition system
2 includes a LADAR system.
- 1 23. The controlled system of claim 21, wherein the LADAR system comprises a
2 direct diode LADAR system.
- 1 24. The controlled system of claim 21, wherein the control subsystem comprises a
2 weapon pointing system.
- 1 25. A method, comprising:
2 acquiring a three-dimensional data set representing the content of a field of view;
3 generating a three-dimensional representation of the content from the three-
4 dimensional data set;
5 displaying the three-dimensional representation;
6 sighting a position within the field of view from the three-dimensional representation;
7 and
8 targeting the sighted position using the three-dimensional data set.

1 26. The method of claim 25, wherein acquiring the three-dimensional data set
2 includes:

3 transmitting a plurality of light pulses; and
4 receiving a plurality of the transmitted light pulses upon their reflection by an object
5 in the field of view.

1 27. The method of claim 26, further comprising:
2 extracting the three-dimensional data from the received light pulses; and
3 storing the received light pulses in a row column format.

1 28. The method of claim 25, wherein generating the three-dimensional
2 representation includes:

3 detecting a region of interest in the three-dimensional image;
4 segmenting a target in the region of interest from the three-dimensional image;
5 extracting features of the segmented target; and
6 classifying the target from the extracted features.

1 29. The method of claim 25, further comprising pre-processing the three-
2 dimensional data.

1 30. The method of claim 25, further comprising transmitting the generated three-
2 dimensional image to a remote location before displaying the three-dimensional image.

1 31. An apparatus, comprising:
2 means for sighting a position correlated to at least a subset of a three-dimensional data
3 set representing a field of view; and
4 means for targeting a controlled system to the position from the three-dimensional
5 data set.

1 32. The apparatus of claim 31, wherein the three-dimensional data comprises
2 LADAR data.

1 33. The apparatus of claim 31, further comprising at least one of:
2 means for acquiring the three-dimensional data;
3 means for processing the three-dimensional data;

4 means for displaying a representation of the three-dimensional data;
5 means for displaying a projected target point after the controlled system is targeted;
6 and
7 means for taking an action responsive to targeting the position.

1 34. The apparatus of claim 31, wherein targeting the controlled system includes
2 aiming a weapon system at the sighted position.

1 35. An apparatus, comprising:
2 means for storing a three-dimensional data set representing a field of view;
3 means for generating a presentation of the three-dimensional data set;
4 means for sighting a position represented by at least a subset of the three-dimensional
5 data and for targeting the position from the subset.

1 36. The apparatus of claim 35, wherein the storing means comprises a magnetic
2 program storage medium or an optical program storage medium.

1 37. The apparatus of claim 35, wherein the generating means comprises a digital
2 processor.

1 38. The apparatus of claim 35, wherein the sighting and targeting means includes
2 a display.

1 39. The apparatus of claim 21, wherein the program storage medium comprises a
2 magnetic program storage medium or an optical program storage medium.

1 40. The apparatus of claim 21, wherein the magnetic program storage medium
2 comprises a floppy disk, a zip disk, or a hard disk.

1 41. The apparatus of claim 21, wherein the controller comprises a digital
2 processor.

1 42. The apparatus of claim 21, wherein the controller interface includes a display.

1 43. The apparatus of claim 21, wherein the display includes a touch screen.

1 44. The method of claim 25, wherein sighting the position indicating a portion of a
2 displayed image generated from the three-dimensional data.